

CLAIMS

What is claimed is:

- 1 1. A method for fabricating a magnetoresistive sensor
2 comprising:
3 a) providing a magnetoresistive structure including one
4 or more ferromagnetic layers;
5 b) disposing a mask between the magnetoresistive
6 structure and an ion source, wherein the mask covers
7 selected portions of the magnetoresistive structure to
8 define a sensor; and
9 c) exposing one or more unmasked portions of the
10 structure to ions to substantially reduce or
11 eliminate a magnetoresistance of the unmasked
12 portions substantially near room temperature while
13 leaving the magnetoresistive structure substantially
14 intact.
- 1 2. The method of claim 1, wherein the ions irradiate
2 one or more ferromagnetic layers in the unmasked
3 portions of the magnetoresistive structure.
- 1 3. The method of claim 1, wherein the ions are
2 implanted into one or more ferromagnetic layers in
3 the unmasked portions of the magnetoresistive
4 structure.
- 1 4. The method of claim 1 wherein ferromagnetism of one
2 or more ferromagnetic layers in the unmasked
3 portions of the magnetoresistive structure is
4 substantially reduced or eliminated, substantially
5 near room temperature.
- 1 5. The method of claim 1 further comprising, prior to
2 c), sputtering the unmasked portions, wherein

3 shadowing by the mask forms one or more tails,
4 wherein the tails are exposed to ions in c).

1 6. The method of claim 1, wherein the mask is a contact
2 photolithographic resist mask.

1 7. The method of claim 1, wherein the mask is a contact
2 electron beam resist mask.

1 8. The method of claim 1, wherein the mask is a stencil
2 mask.

1 9. The method of claim 1, wherein the ions are
2 projected through a mask and focused onto the
3 magnetoresistive structure.

1 10. The method of claim 1 allows widths of the
2 magnetoresistive sensor between about 5nm and about
3 200nm.